

ABSTRACT OF THE DISCLOSURE

An improved mass analyzer capable of parallel processing one or more analytes is set forth. The mass analyzer comprises a mass filter unit having a plurality of ion selection chambers disposed in parallel with one another. Each of the plurality of ion selection chambers respectively includes an ion inlet lying in an inlet plane and an ion outlet lying in an outlet plane. The mass analyzer further includes a plurality of electrodes disposed in the ion selection chambers and at least one RF signal generator connected to the plurality of electrodes to produce a non-rotating, oscillating electric field in each ion selection chambers. A plurality of ion injectors are each coupled to inject an ion beam into the ion inlet of a respective ion selection chambers. The ions meeting predetermined m/Q requirements pass through the ion selection chambers to contact corresponding detection surfaces of an ion detector array. The mass filter array may also be constructed so that at least one pair of ion selection chambers share at least one common field generating electrode.